

(19)

Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 0 970 677 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
12.01.2000 Bulletin 2000/02

(51) Int Cl.7: A61F 13/15

(21) Application number: 99305170.5

(22) Date of filing: 30.06.1999

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

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(30) Priority: 30.06.1998 JP 18504298

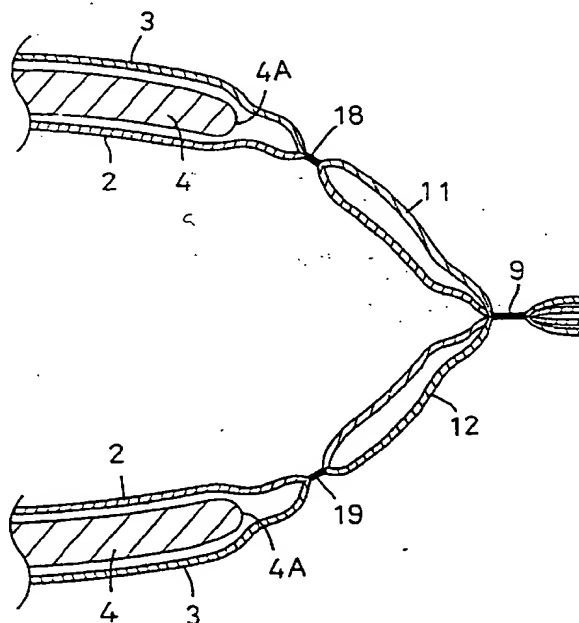
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(54) Pull-on disposable diaper

(57) A pull-on disposable diaper 1 has front and rear waist regions 6, 7 placed upon each other along their respective side edges 11, 12 and bonded together at outer bonding zone 9 intermittently arranged along these side edges 11, 12. A plurality of sheet materials forming the respective side edges 11, 12 of the front and

rear waist regions 6, 7 are bonded together along an inner bonding zones 18, 19 vertically extending inside each of the outer bonding zone 9. The inner bonding zone prevents transversely opposite side edges of the diaper from being torn in a circumferential direction thereof, when the transversely opposite side edges of the diaper are torn off vertically of the diaper.

FIG.2



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Description

[0001] This invention relates to a pull-on disposable diaper for absorption and containment of body wastes.

[0002] Japanese Patent Application Disclosure Gazette (Kokai) No. Hei5-15551 discloses a pull-on disposable diaper in which front and rear waist regions comprising a topsheet and a backsheet containing heat-sealable materials are placed upon each other along their respective side edges and heat-sealed together at heat-sealing spots intermittently arranged on the side edges vertically of the diaper. A wearer of such diaper can be stripped thereof by tearing the diaper from top to bottom along the respective arrays of the heat-sealing spots so that the front and rear waist regions may be separated from each other forth and back. By stripping the wearer of the diaper in this manner, the wearer's legs can be protected from being soiled with body wastes.

[0003] With the pull-on disposable diaper according to the above-mentioned prior art, if the topsheet and/or the backsheet are fiber-oriented transversely of the diaper, the lines along which the diaper should be torn are apt to turn aside following the fiber orientation in the course of tearing the diaper vertically thereof. Such a tendency often makes it difficult to tear off the diaper in an orderly manner.

[0004] In view of the problem as has been described above, it is an object of the present invention to provide a pull-on disposable diaper having front and rear waist regions placed upon and bonded to each other along their respective side edges improved so that the diaper may be torn off in a relatively easy manner in the vertical direction.

[0005] According to the present invention, there is provided a pull-on disposable diaper having a front waist region and a rear waist region, the diaper comprising a liquid-pervious topsheet, a liquid-impervious backsheet and a liquid-absorbent core disposed between the topsheet and the backsheet, each of transversely opposed side edges of the front and rear waist regions being placed upon each other and bonded together at an outer bonding zone intermittently arranged on each of the side edges in a vertical direction of the diaper.

[0006] Each of the side edges of the front and rear waist regions bonded together comprises a plurality of sheet materials placed one upon another, the plurality of sheet materials being bonded together along an inner bonding line extending in parallel to the outer bonding line at each of the front and rear waist regions, with said inner bonding line being spaced inwardly from the outer bonding line by 3 - 20 mm.

[0007] According to one preferred embodiment of the present invention, at least one of the plurality of sheet materials contains thermoplastic synthetic resin, the inner bonding line is formed by heat-sealing the thermoplastic synthetic resin.

[0008] According to another preferred embodiment of the present invention, the plurality of sheet materials

placed one upon another along each of the side edges comprise the topsheet and the backsheet.

[0009] According to still another preferred embodiment of the present invention, one of the topsheet and the backsheet includes a nonwoven fabric fiber-oriented transversely of the diaper.

[0010] According to further another preferred embodiment of the present invention, the backsheet is a laminate sheet comprising a thermoplastic synthetic resin film as an inner layer and a nonwoven fabric of thermoplastic synthetic resin as an outer layer.

Fig. 1 is a perspective view showing a pull-on disposable diaper according to one preferred embodiment of the present invention as partially broken away; and

Fig. 2 is a sectional view taken along a line II-II in Fig. 1.

[0011] Details of a pull-on disposable diaper according to the present invention will be more fully understood from the description given hereunder with reference to the accompanying drawings.

[0012] A pull-on disposable diaper 1 shown by Fig. 1 in a perspective view as partially broken away comprises a liquid-pervious topsheet 2, a liquid-impervious backsheet 3 and a liquid-absorbent core 4 disposed between these two sheets 2, 3. The topsheet 2 and the backsheet 3 are bonded to each other along their portions extending outward beyond a peripheral edge of the absorbent core 4. Configurationally, the diaper 1 is composed of a front waist region 6, a rear waist region 7 and a crotch region 8 extending between these two waist regions 6, 7. The front and rear waist regions 6, 7 are placed upon each other along their respectively opposite side edges 11, 12 and bonded together at vertically intermittent bonding spots 9 arranged along the respective side edges 11, 12. The diaper 1 further has a waist-opening 14 and a pair of leg-openings 15, these openings 14, 15 being provided along their peripheral edges with elastic members 16, 17 secured under appropriate tension, respectively. The elastic member 16 is adapted to surround a wearer's torso and the elastic members 17 are adapted to surround the wearer's legs. The elastic members 16, 17 are disposed between the topsheet 2 and the backsheet 3 and bonded to an inner surface of at least one of these sheets 2, 3. The topsheet 2 and the backsheet 3 are bonded to each other not only at the bonding spots 9 but also along bonding lines 18, 19 respectively extending from edges of the waist-opening 14 to edges of the leg-openings 15 in parallel to the respective side edges 11, 12 of the front and rear waist regions 6, 7 inside each of the arrays of bonding spots 9.

[0013] In such diaper 1, a certain amount of thermoplastic synthetic resin is contained in the topsheet and/or the backsheet 3. For example, the topsheet 2 may be made of a apertured film of thermoplastic synthetic resin or a nonwoven fabric of thermoplastic synthetic resin

and the backsheet 3 may be made of a thermoplastic synthetic resin film or of a laminate sheet comprising the film as an inner layer and a nonwoven fabric of thermoplastic synthetic fiber as an outer layer. These topsheet 2 and the backsheet 3 are bonded to each other along the arrays of bonding spots 9 and the bonding lines 18, 19 by means of suitable adhesive agent or the heat-sealed amount of the thermoplastic synthetic resin making a part of the topsheet 2 and the backsheet 3.

[0014] Fig. 2 is a sectional view taken along a line II-II in Fig. 1. Portions of the topsheet 2 and the backsheet 3 forming the respective side edges 11, 12 of the front and rear waist regions 6, 7 are placed upon and bonded to each other along the arrays of bonding spots 9. In addition, the topsheet 2 and the backsheet 3 are bonded to each other also along the bonding lines 18 and 19 in the front and rear waist regions 6, 7, respectively. The bonding lines 18, 19 lie between the arrays of bonding spots 9 and respective side edges 4A of the absorbent core 4, preferably inward spaced from the respective arrays of bonding spots 9 by 3 - 20 mm.

[0015] When it has been perceived that feces has been discharged on the diaper 1 of such an arrangement worn by a baby, the baby may be stripped of his or her diaper 1 by tearing off the front and rear waist regions 6, 7 along the arrays of bonding spots 9 of the diaper 1 so that these two waist regions 6, 7 are separated from each other forth and back. It should be minded here that, if the nonwoven fabric or the synthetic resin film used as the stock material for the topsheet 2 and/or the backsheet 3 are oriented circumferentially of the diaper 1, the tear will be apt to turn aside in the circumferential direction on the way of tearing the diaper 1 in the vertical direction. Such a tendency sometimes makes it difficult to separate the front and rear waist regions 6, 7 from each other in an orderly manner. However, in the case of the diaper 1 according to the present invention, even when the respective side edges 11, 12 of the front and rear waist regions 6, 7 being torn off begin to be torn in the circumferential direction, the respective tears can not further run across the bonding lines 18, 19 and run again downward without running in the circumferential direction.

[0016] Each of the bonding lines 18, 19 is preferably dimensioned to be 1 - 7 mm wide, more preferably to be 1 - 5 mm wide and preferably depressed in the direction of sheet thickness so that a touch of the diaper should not be deteriorated due to the presence of these bonding lines 18, 19. While the bonding lines 18, 19 are shown to extend from the edge of the waist-opening 14 to the edges of the respective leg-openings 15, the alternative embodiments are possible in which, adjacent the elastic members 16 for the waist-opening 14 as well as the elastic members 17 for the leg-openings 15, the topsheet 2 and the backsheet 3 are bonded together without containing these members 16, 17 therebetween. An arrangement is also possible in which the bonding lines 18, 19 lie in an extent defined below the

elastic member 16 associated with the waist-opening 14 and above the elastic members 17 associated with the respective leg-openings 15. While the respective side edges 11, 12 of the front and rear waist regions 6, 7 are shown to be formed by the topsheet 2 and the backsheet 3, an alternative arrangement is also possible in which a third sheet is disposed between the topsheet 2 and the backsheet 3 or extension sheet material such as a sheet having a breathability or a heat durability higher than those of the topsheet 2 and the backsheet 3 is put to the topsheet 2 and the backsheet 3 so that such extension sheet may form the respective side edges 11, 12.

[0017] The pull-on disposable diaper according to the present invention is advantageously characterized in that a plurality of sheets forming the front and rear waist regions of the diaper are bonded together along the bonding lines extending vertically of the diaper inside the arrays of bonding spots along which the respective side edges of the front and rear waist regions placed upon and bonded to each other. This unique arrangement is effective to avoid any apprehension that, when the side edges of the diaper are torn off, the tears might turn aside in the circumferential direction and inwardly run across the respective bonding lines.

Claims

1. A pull-on disposable diaper having a front waist region and a rear waist region, said diaper comprising a liquid-pervious topsheet, a liquid-impervious backsheet and a liquid-absorbent core disposed between said topsheet and said backsheet, each of transversely opposed side edges of said front and rear waist regions being placed upon each other and bonded together at an outer bonding line intermittently arranged on each of said side edges in a vertical direction of said diaper, wherein:

each of said side edges of said front and rear waist regions bonded together comprises a plurality of sheet materials placed one upon another, said plurality of sheet materials being bonded together along an inner bonding line extending in parallel to said outer bonding line at each of said front and rear zones, with said inner bonding line being spaced inwardly from said outer bonding line by 3 - 20 mm.

2. The diaper according to Claim 1, wherein at least one of said plurality of sheet materials contains thermoplastic synthetic resin, said inner bonding line is formed by heat-sealing said thermoplastic synthetic region.

3. The diaper according to Claim 1, wherein said plurality of sheet materials placed one upon another along each of said side edges comprise said topsheet and said backsheet.

4. The diaper according to Claim 1, wherein one of said topsheet and said backsheet includes a non-woven fabric fiber-oriented transversely of said diaper.
5. The diaper according to Claim 1, wherein said backsheet is a laminate sheet comprising a thermoplastic synthetic resin film as an inner layer and a non-woven fabric of thermoplastic synthetic resin as an outer layer.

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FIG. 1

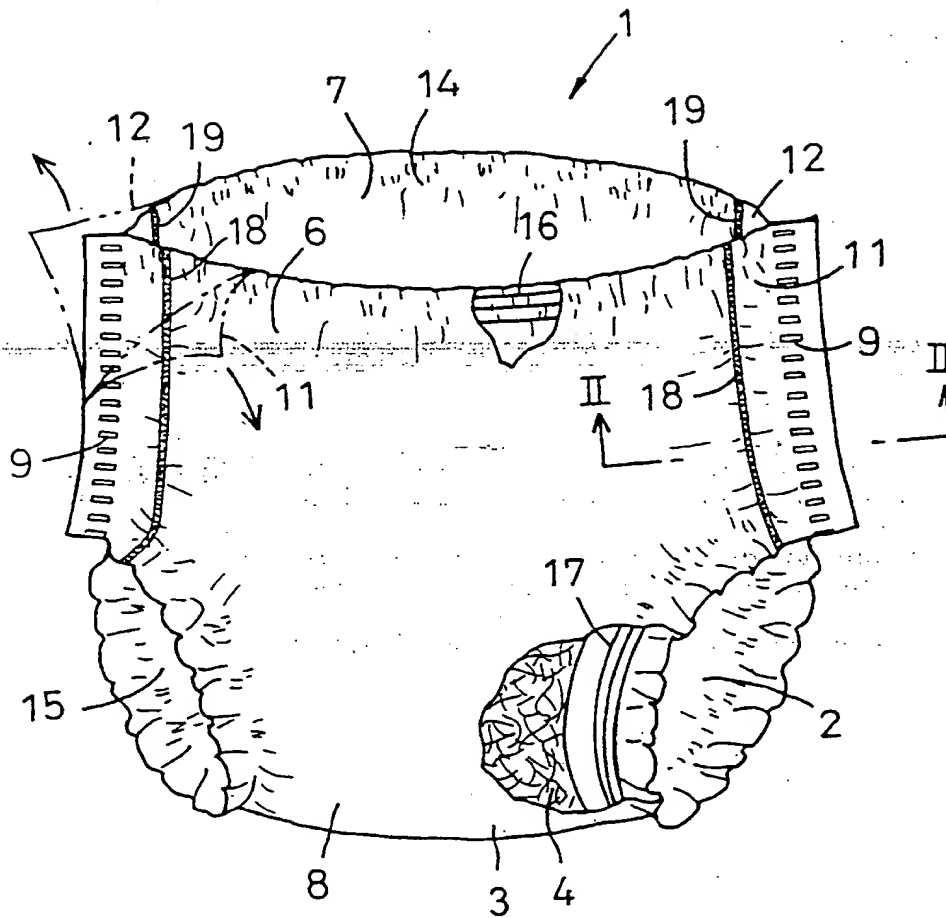
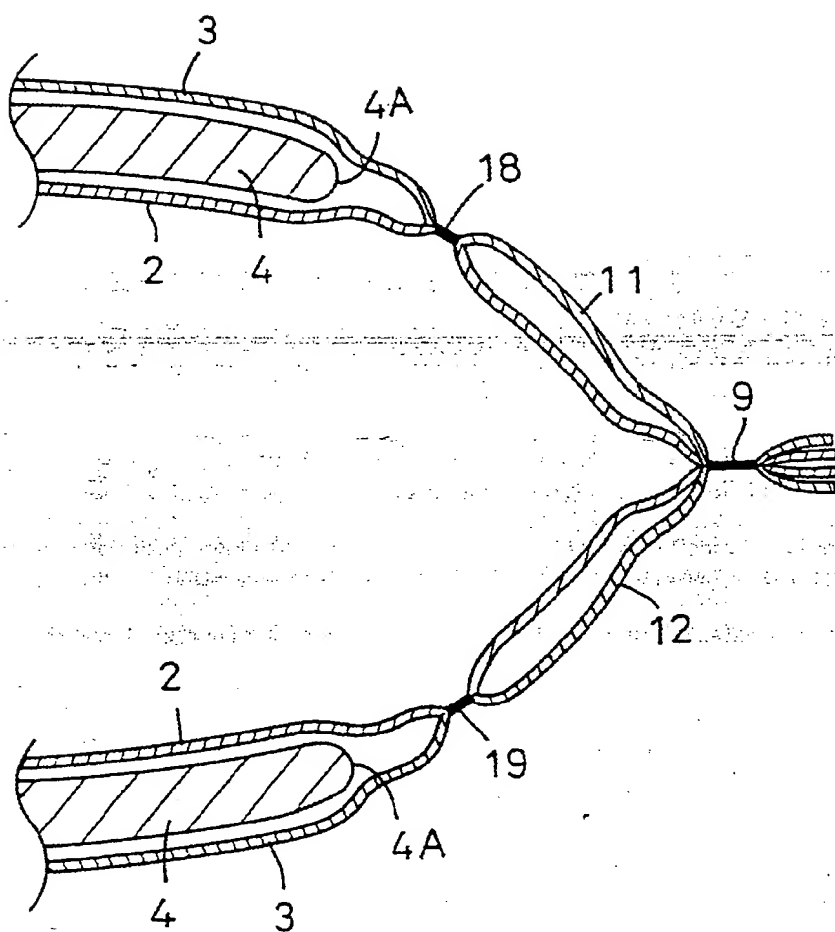


FIG.2





(11) **EP 0 970 677 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
06.12.2000 Bulletin 2000/49

(51) Int Cl.7: **A61F 13/15**

(43) Date of publication A2:
12.01.2000 Bulletin 2000/02

(21) Application number: **99305170.5**

(22) Date of filing: **30.06.1999**

(84) Designated Contracting States:
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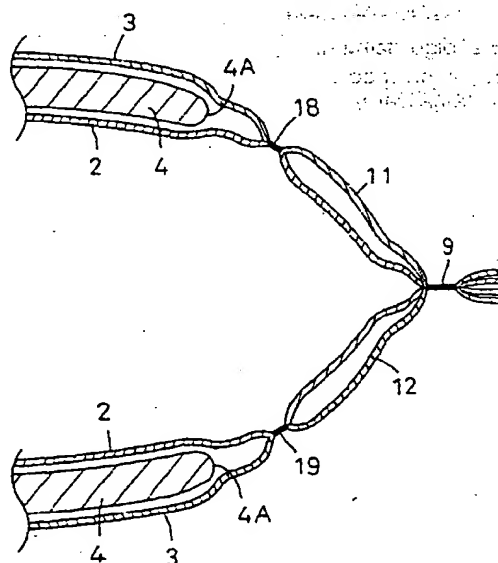
(30) Priority: **30.06.1998 JP 18504298**

(71) Applicant: **UNI-CHARM CORPORATION**
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FIG. 2



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European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 99 30 5170

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	WO 95 00096 A (PROCTER & GAMBLE) 5 January 1995 (1995-01-05) * page 11, line 6 - line 20 * * page 12, line 33 - page 13, line 1; claims; figures *	1-3	A61F13/15
A	US 4 205 679 A (BROOKS RALPH H JR ET AL) 3 June 1980 (1980-06-03) * claims; figures 8,14,15,22A-22C *	1-3	
A	EP 0 597 331 A (KIMBERLY CLARK CO) 18 May 1994 (1994-05-18) * column 4, line 2 - line 19; figures 1,5, *	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7) * A61F
Place of search THE HAGUE		Date of completion of the search 10 October 2000	Examiner Mirza, A
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1533 03 02 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 99 30 5170

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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10-10-2000

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9500096	A	05-01-1995	AU 7059994 A	17-01-1995
			CA 2165288 A	05-01-1995
			DE 69418713 D	01-07-1999
			DE 69418713 T	11-11-1999
			EP 0705088 A	10-04-1996
			ES 2131691 T	01-08-1999
			JP 8511709 T	10-12-1996
			US 5624420 A	29-04-1997
US 4205679	A	03-06-1980	AU 512895 B	06-11-1980
			AU 2724777 A	25-01-1979
			BR 7704844 A	25-04-1978
			CA 1109202 A	22-09-1981
			ES 238909 U	16-05-1979
			JP 53019246 A	22-02-1978
			NZ 184646 A	27-05-1980
			ZA 7704456 A	28-02-1979
EP 0597331	A	18-05-1994	AT 105150 T	15-05-1994
			DE 8817215 U	14-07-1994
			AT 160280 T	15-12-1997
			AU 612742 B	18-07-1991
			AU 2698688 A	22-06-1989
			BR 8806698 A	29-08-1989
			CA 1326328 A	25-01-1994
			CA 1329864 A	31-05-1994
			CA 1338920 A	25-02-1997
			DE 3856073 D	02-01-1998
			DE 3856073 T	10-06-1998
			DE 3889435 D	09-06-1994
			DE 3889435 T	01-09-1994
			DE 8817217 U	11-08-1994
			EP 0320991 A	21-06-1989
			ES 2051825 T	01-07-1994
			ES 2108798 T	01-01-1998
			HK 1005058 A	18-12-1998
			JP 2004364 A	09-01-1990
			JP 2579679 B	05-02-1997
			KR 9308207 Y	13-12-1993
			KR 9308208 Y	13-12-1993
			KR 9308209 Y	13-12-1993
			US 4940464 A	10-07-1990
			ZA 8809174 A	27-12-1989
			BR 8806697 A	29-08-1989
			US 4938757 A	03-07-1990

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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